

CLAIMS:

1. A scavenge system for a bearing assembly, the system comprising a scavenging passage extending axially through a rotating shaft supported by the bearing assembly, and at least one scoop provided on the rotating shaft, said at least one scoop impelling oil internally of said rotating shaft into said scavenging passage as said at least one scoop rotates with said rotating shaft.
2. A scavenge system as defined in claim 1, wherein at least two scoops are defined in said rotating shaft, and wherein each pair of adjacent scoops defines an inlet passage therebetween, said inlet passage being in fluid flow communication with said scavenging passage.
3. A scavenge system as defined in claim 1, wherein said at least one scoop curves radially outwardly in a direction of rotation of said rotating shaft.
4. A scavenge system as defined in claim 1, wherein said at least one scoop has a curved cross-section which is thinner toward the outer surface of the rotating shaft.
5. A scavenge system as defined in claim 2, further comprising a number of conduits in fluid communication with an oil cavity communicating with the bearing assembly, the conduits defining a plurality of circumferentially aligned openings in an annular inner surface closely surrounding an outer surface of the rotating shaft.
6. A scavenge system as defined in claim 1, wherein said scavenging passage is concentric with the rotating shaft and in fluid flow communication with a stationary chamber.

7. A scavenge system as defined in claim 5, wherein there is provided at least two angularly spaced-apart inlet passages in the rotating shaft between the scoops, each of the inlet passages being defined such as to alternately be aligned with each of the plurality of openings during a rotation of the shaft, the rotation of the shaft creating an interaction between aligned inlet passages and openings such that used oil flowing from the conduits is drawn from the openings to the inlet passages, so as to flow through the scavenge passage axially of the rotating shaft.
8. A scavenge system as defined in claim 7, wherein the scavenge passage is annular.
9. A scavenge system as defined in claim 5, wherein each of the conduits is composed of a first tube connected to a second tube, the first tube extending along an axial direction of the rotating shaft and the second tube extending along a radial direction of the rotating shaft.
10. A scavenge system as defined in claim 1, wherein each inlet passage is perpendicular to the scavenge passage and is inclined with respect to a radius of the rotating shaft.
11. A scavenge system as defined in claim 5, wherein the plurality of openings are grouped in series of closely adjacent openings, the series being regularly angularly spaced apart.
12. A scavenge system as defined in claim 6, wherein the stationary chamber is located at a downstream end of the rotating shaft.
13. A scavenge system for a bearing assembly, the system comprising a scavenging passage extending axially through a rotating shaft supported by the bearing assembly, and means provided on the rotating shaft for drawing oil internally of said rotating shaft into said scavenging passage as said shaft rotates.

14. A scavenge system as defined in claim 13, wherein said means comprise at least one hole defined in said rotating shaft, said at least one hole being perpendicular to an axis of the rotating shaft and at an angle to a radius thereof.

15. A scavenge system as defined in claim 13, wherein said means comprise at least one scoop provided at the outer surface of the rotating shaft, said at least one scoop picking up oil at the outer surface of the shaft and directs the oil into said scavenge passage as the shaft rotates.

16. A scavenge system as defined in claim 15, wherein said means comprise at least two scoops defined in said rotating shaft, and wherein each pair of adjacent scoops defines an inlet passage therebetween, said inlet passage being in fluid flow communication with said scavenging passage.

17. A scavenge system as defined in claim 15, wherein said at least one scoop curves radially outwardly in a direction of rotation of said rotating shaft.

18. A scavenge system as defined in claim 15, wherein said at least one scoop has a curved cross-section which is thinner toward the outer surface of the rotating shaft.

19. A scavenge system as defined in claim 13, further comprising: first fluid communication means between a lubricant cavity containing the bearing assembly and an annular inner surface closely surrounding an outer surface of the rotating shaft.

20. A scavenge system as defined in claim 19, wherein said first fluid communication means comprise a number of conduits in fluid communication with the lubricant cavity, the conduits defining a plurality of circumferentially aligned openings in said annular inner surface.

21. A gas turbine engine comprising a compressor section, a combustor and a turbine section in serial flow communication with one another, a main rotating shaft supported by a bearing assembly, and a scavenge system for the bearing assembly, the scavenge system comprising a scavenging passage extending axially through said main rotating shaft, and at least one inlet hole defined in said main rotating shaft and in flow communication with said scavenging passage, said at least one inlet hole extending at an angle to a radius of the main rotating shaft to thereby cause oil about the rotating shaft to be drawn into said scavenging passage in said main shaft via said at least one inlet hole as said main shaft rotates.

22. A gas turbine engine as defined in claim 21, wherein said at least one inlet hole curves radially outwardly in a direction of rotation of said main rotating shaft.

23. A gas turbine engine as defined in claim 21, wherein at least two inlet holes are defined in said main rotating shaft, and wherein a remaining portion of the main rotating shaft between each pair of adjacent inlet holes defines a scoop, the scoop being shaped such as to pick up oil at an interface with said main rotating shaft and to redirect the oil internally of the main rotating shaft into said scavenging passage.

24. A gas turbine engine as defined in claim 21, further comprising a number of conduits in fluid communication with an oil cavity communicating with the bearing assembly, the conduits defining a plurality of circumferentially aligned openings in an annular inner surface closely surrounding an outer surface of the rotating shaft in alignment with said at least one inlet hole.

25. A scavenge system for a bearing assembly supporting a rotating shaft in a gas turbine engine, the system comprising:

- first fluid communication means between a lubricant cavity containing the bearing assembly and an annular inner surface closely surrounding an outer surface of the rotating shaft;
- second fluid communication means within the rotating shaft communicating with a stationary chamber; and
- third fluid communication means between the outer surface of the rotating shaft and the second fluid communication means, the third fluid communication means being defined such as to communicate with the first fluid communication means during at least a portion of a rotation of the shaft, and such that the rotation of the shaft causes used lubricant coming from the lubricant cavity to be moved from the first fluid communication means to the third fluid communication means so as to deliver the used lubricant to the stationary chamber through the second fluid communication means.

26. A scavenge system as defined in claim 25, wherein the third fluid communication means are defined by scoop means located at the outer surface of the rotating shaft, the scoop means contributing to moving the lubricant from the first fluid communication means to the third fluid communication means.

27. A scavenge system as defined in claim 25, wherein the stationary chamber is located at one end of the rotating shaft.

28. A method of evacuating scavenge air and oil from a bearing assembly supporting a main shaft of a gas turbine engine, the method comprising the steps of: a) feeding the scavenge air and oil from the bearing assembly to an interface with said main shaft, b) drawing the scavenge air and oil from said interface into said main shaft, and c) evacuating the oil axially through said main shaft.

29. A method as defined in claim 28, wherein step a) comprises the steps of: defining a plurality of circumferentially aligned openings in an annular surface of a bearing compartment, the annular surface being located at the interface between the

bearing compartment and the main shaft, and providing fluid communication between the bearing compartment and the openings.

30. A method as defined in claim 29, wherein step b) comprises the steps of: defining a plurality of circumferentially aligned holes in the rotating shaft at the interface, the holes being defined such as to create an interaction between the holes and the openings which draws the air and oil from the openings to the holes upon rotation of the main shaft;

31. A method as defined in claim 30, wherein step c) comprises the steps of: providing fluid communication within the main shaft from the holes to a stationary chamber; and rotating the main shaft so as to produce the interaction between the holes and the openings such that the air and oil are moved from the bearing compartment to the stationary chamber.